Service Manual

Model 31AS6BN2711 Two-Stage Snow Thrower

NOTE: These materials are for use by trained technicians who are experienced in the service and repair of outdoor power equipment of the kind described in this publication, and are not intended for use by untrained or inexperienced individuals. These materials are intended to provide supplemental information to assist the trained technician. Untrained or inexperienced individuals should seek the assistance of an experienced and trained professional. Read, understand, and follow all instructions and common sense when working on power equipment. This includes the contents of the product's Operators Manual, supplied with the equipment. No liability can be accepted for any inaccuracies or omission in this publication, although care has been taken to make it as complete and accurate as possible at the time of publication. However, due to the variety of outdoor power equipment and continuing product changes that occur over time, updates will be made to these instructions from time to time. Therefore, it may be necessary to obtain the latest materials before servicing or repairing a product. The company reserves the right to make changes at any time to this publication without prior notice and without incurring an obligation to make such changes to previously published versions. Instructions, photographs and illustrations used in this publication are for reference use only and may not depict actual model and component parts. © Copyright 2005 MTD Products Inc. All Rights Reserved

MTD Products LLC - Product Training and Education Department

FORM NUMBER 769-01420

9/2004

SERVICE MANUAL
31AS6BN-711 Snow Thrower

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SERVICE MANUAL
31AS6BN2-711 Snow Thrower

31AS6BN2711 (TROY-BILT AS SPECIFIED FOR LOWE'S

SNOW THROWER MODEL NUMBER 31AS6BN2711
SERIAL # 1G144B40028

- Two Stage 5.5 HP Electric Start
- 24" Clearing Width
- 6 Forward Speeds and 2 Reverse Speeds
- X – Track Tires

GENERAL INFORMATION

The Owner's Manual packet includes and engine manual, extra shear pins and cotter pins as well as a packet containing a sample of Sta-Bill fuel stabilizer that will treat up to 2 ½ gallons of regular gas.

> **CAUTION:** When assembling the handle for the first time, use caution when lifting the handle. The shift lever rod can get caught on the lower handle cross member and if forced into position can bend the spring shift lever. If necessary, move the shift rod in front of the cross member as you raise the handle into position.

There are two Supplement Sheet dated July 19, 2004, and July 20, 2004 – Subject: Connector Sleeve on Two Stage Snow Thrower shift rod. (Styles: E, F, H, K, L, N, O, P and Q.)

Vibration may cause the rod connector sleeve to slide up out of position. The remedy is to slide the connecter sleeve fully down.

Secure it in place by placing a rubber bushing over the top of the lower shift rod OR the upper shift rod. (A small piece of gas line can be used as a bushing.) This will prevent the sleeve from sliding up the shaft. See Figure 1.

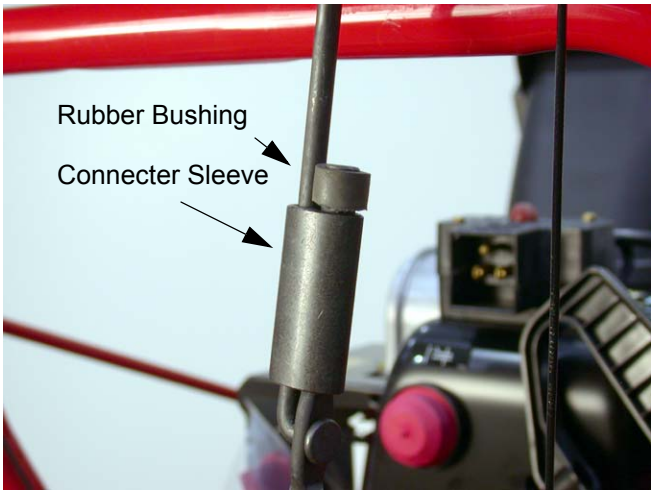

Figure 1

Rubber bands hold the Auger and Drive control cables in their respective nylon pulleys during shipping and generally break during assembly of the handle. Remove any pieces of rubber band after assembly.

There is a storage area in the handle panel used for holding the spare auger shear pins. See Figure 2.

Figure 2

1. TIRE PRESSURE

Before operating, check tire pressure. Both tires should be between 15 psi and 20 psi.

NOTE: If the tire pressure is not equal in both tires, the unit may pull to one side or the other during operation.

2. CHUTE INSTALLATION

2.1. Apply a light lubricant to the rim/lip of the chute base (and the underside of the chute assembly) and position the chute over the base.

2.2. Close the flange keepers to secure the chute to the base. See Figure 3.

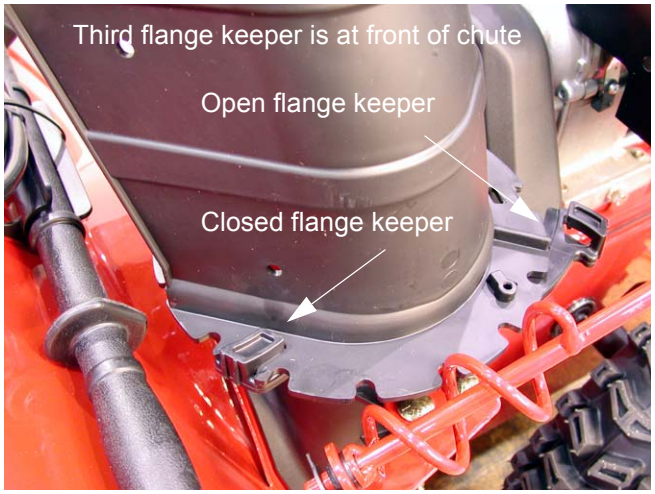

Figure 3

NOTE: If the flange keepers will not easily click into place, use the palm of your hand to apply swift, firm pressure to the back of each.

3. DISCHARGE CHUTE REMOVAL

3.1. To remove the discharge chute, use the blade-side of a screwdriver by wedging between the housing and the flange keepers and with a lifting and prying motion lift the locking flange out of the locked position and pivot the flange keepers outwards.

3.2. Lift the chute assembly off the mounting base of the main housing.

4. DIRECTIONAL CONTROL ASSEMBLY

4.1. Remove the flat washer and hairpin clip from the end of the chute directional control.

4.2. Insert the end of the chute directional control into the lower bracket and secure with the flat washer and hairpin clip. See Figure 4.

Figure 4

5. CHUTE BRACKET ADJUSTMENT

If necessary the Chute Bracket can be adjusted if the spiral at the bottom of the directional control is not fully engaging the chute assembly.

5.1. Loosen the two nuts, which secure the chute bracket and reposition it slightly before retightening the nuts. See Figure 5.

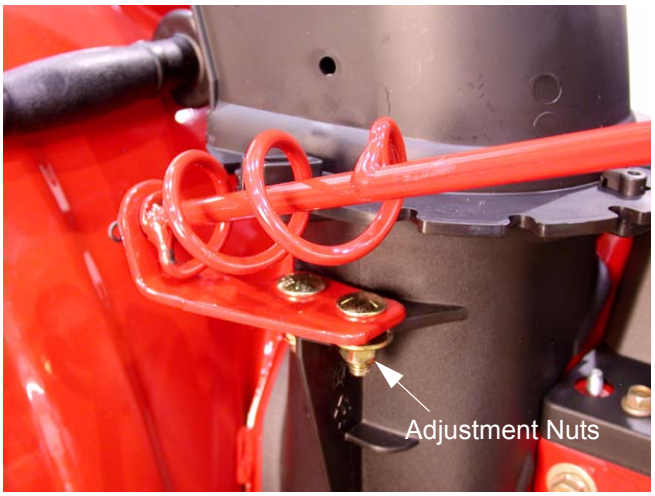

Figure 5

6. SKID SHOE AND SHAVE PLATE ADJUSTMENT

The space between the shave plate and the ground can be adjusted.

For close snow removal on a smooth surface, raise skid shoes higher on the auger housing to lower the shave plate.

Use a middle or lower position when the area to be cleared is uneven, such as a gravel driveway.

CAUTION: Loose gravel can be picked up and thrown by the auger, causing injury to the operator and bystanders and/or damage to the snow thrower and surrounding property.

For initial adjustment we recommend placing the shave plate on a piece of cardboard.

6.1. Loosen the four hex nuts (two on each side) and carriage bolts attaching the skid shoes to the auger housing. See Figure 6.

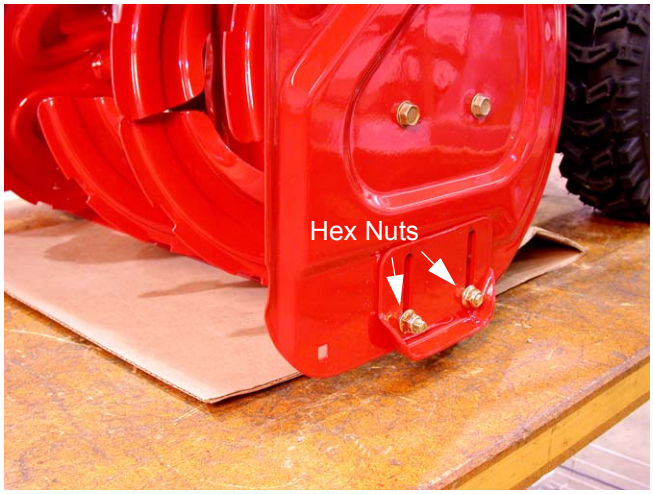

Figure 6

6.2. Move the skid shoes to the ground.

6.3. Tighten the hex nuts.

NOTE: Make certain the entire bottom surface of skid shoe is against the ground to avoid uneven wear on the skid shoes.

7. SHAVE PLATE REMOVAL

The shave plate will wear over time. It can be replaced as needed.

NOTE: You will need to remove the skid shoes in order to remove the shave plate.

7.1. Remove the carriage bolts and hex nuts which attach it to the auger housing.

7.2. Reassemble the new shave plate, making sure the heads of the carriage bolts are to the inside of the housing. Tighten securely. See Figure 7.

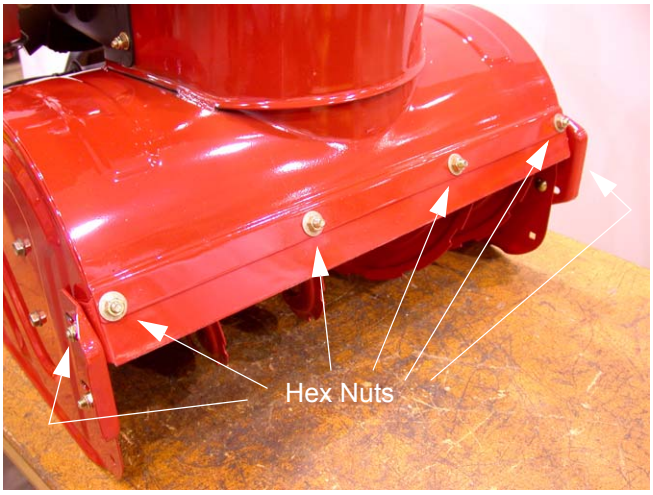

Figure 7

8. DRIVE CONTROL CABLE ADJUSTMENT

When the drive control is released and in the disengaged, or "up" position, the cable should have very little slack. It should NOT be tight.

Check the adjustment of the drive control as follows:

8.1. With the drive control released, push the snow thrower gently forward. The unit should roll freely.

8.2. Engage the drive control and gently attempt to push the snow thrower forward. The wheels should not turn. The unit should not roll freely.

8.3. With the drive control released, move the shift lever back and forth between the R2 position and the F6 position several times. There should be no resistance in the shift lever.

If any of the above tests failed, the drive cable is in need of adjustment.

8.4. Loosen the hex jam nut on the auger control cable "Z" fitting and rotate the coupling end of the cable downward to provide more slack or upward to take up slack. See Figure 8.

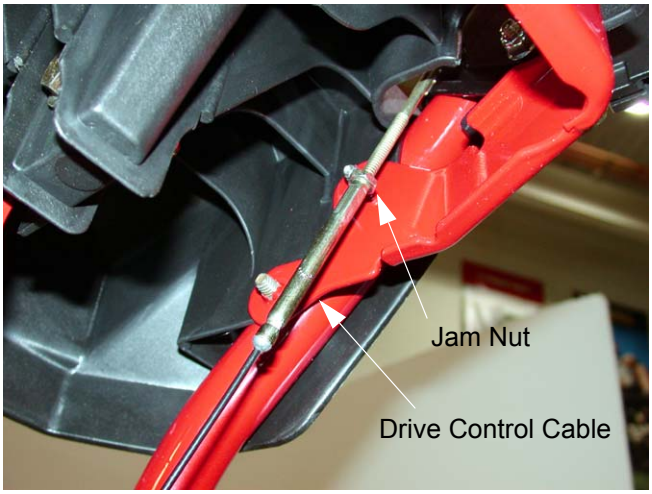

Figure 8

8.5. Retighten the hex jam nut and repeat all three tests to verify proper adjustment has been achieved.

9. AUGER CONTROL TESTING AND ADJUSTMENT

9.1. Start the engine and run it at full throttle.

9.2. While standing in the operator position, engage the auger. Do this several times.

9.3. Release the auger control and walk to the front of the unit. Confirm that the auger has completely stopped rotating and shows NO signs of motion.

IMPORTANT: If the auger shows ANY signs of rotating, immediately return to the operator's position and shut off the engine. Wait for ALL moving parts to stop before re-adjusting the auger control.

9.4. To readjust the control cable, loosen the hex jam nut on the auger control cable "Z" fitting. Rotate the coupling end of the cable counterclockwise to provide more slack. Retighten the hex jam nut. See Figure 9.

Figure 9

9.5. Repeat Auger Control Test to verify proper adjustment has been achieved.

WARNING: Never attempt to make any adjustments while the engine is running, except where specified in operator's manual.

The augers are secured to the spiral shaft with two shear pins and cotter pins. If the auger should strike a foreign object or ice jam, the snow thrower is designed so that the pins may shear. See Figure 10.

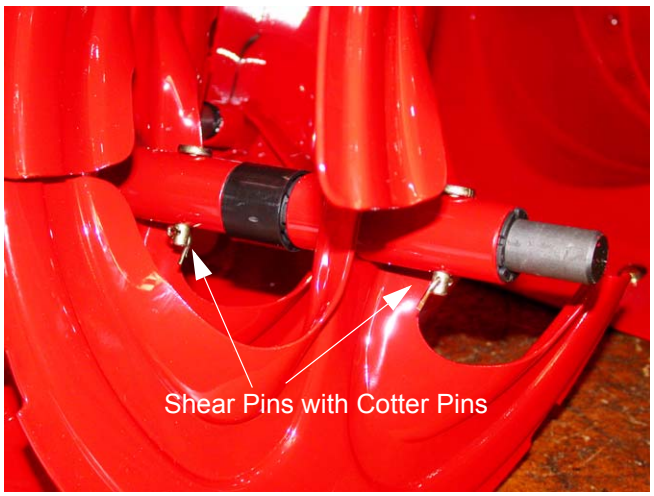

Figure 10

If the augers will not turn, check to see if the pins have sheared.

One set of replacement shear pins has been provided with the snow thrower.

When replacing pins, spray an oil lubricant into shaft before inserting new pins.

10. SHIFT ROD ADJUSTMENT

If the full range of speeds (forward and reverse) cannot be achieved, adjust the shift rod.

10.1. Place the shift lever in the fastest forward speed position and remove the hairpin clip which secures the ferrule to the shift lever. See Figure 11.

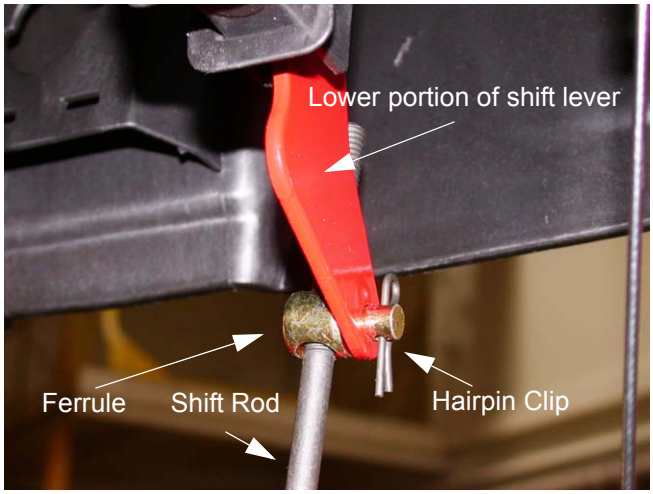

Figure 11

10.2. Rotate the shift arm clockwise as far as it will go. See Figure 12.

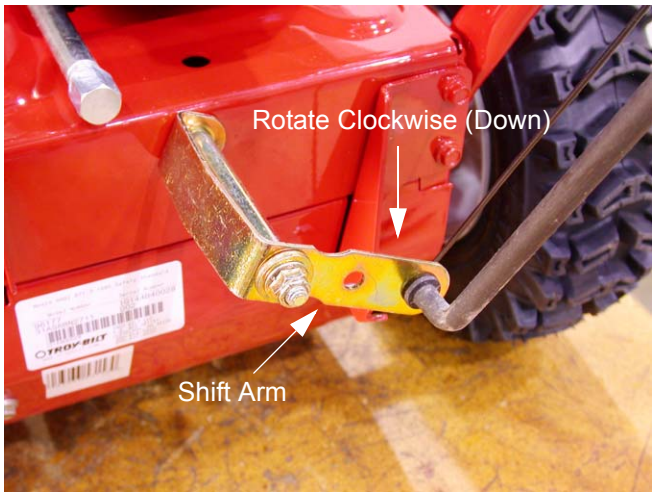

Figure 12

10.3. Thread the ferrule up or down the shift rod until it aligns with the hole in the shift lever.

10.4. Re-secure the ferrule with the hairpin clip removed earlier.

11. AUGER BELT REPLACEMENT

11.1. Using a 3/8” socket and extension, remove the two self-tapping screws securing the plastic belt cover to the frame. See Figure 13.

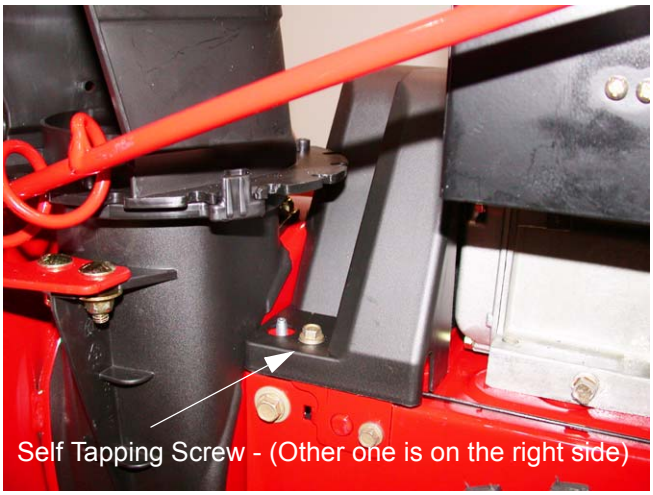

Figure 13

11.2. Drain the gasoline from the snow thrower, or place a piece of plastic under the gas cap

11.3. Disconnect the spark plug wire from the spark plug. See Figure 14.

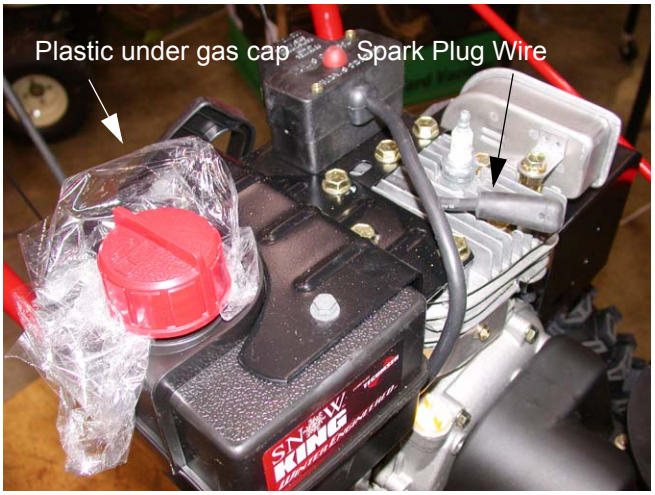

Figure 14

11.4. Carefully pivot the snow thrower up and forward so that it rests on the auger housing.

11.5. Using a 3/8” socket, remove the four self-tapping screws which secure the frame cover to the frame. See Figure 15.

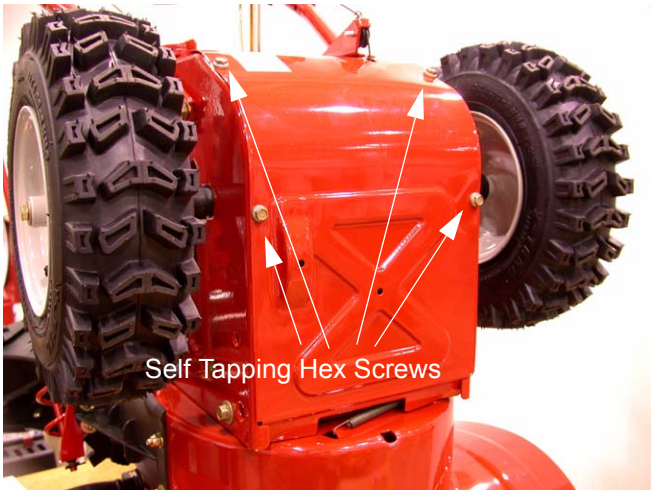

Figure 15

11.6. Roll the auger belt off the engine pulley. See Figure 16.

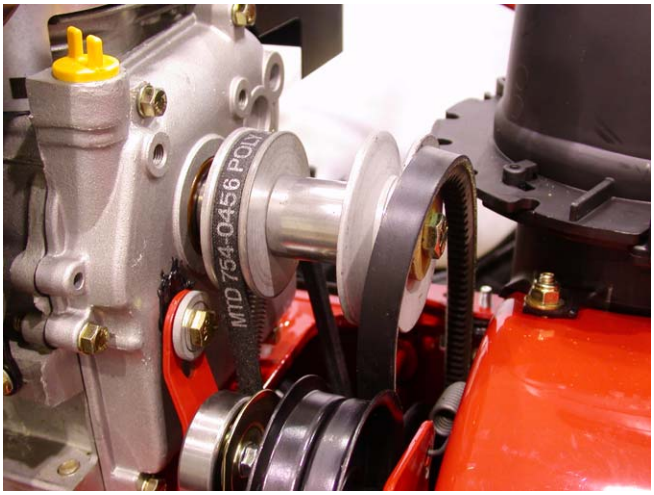

Figure 16

11.7. Using a piece of starter cord, unhook the support bracket spring from the frame. See Figure 17.

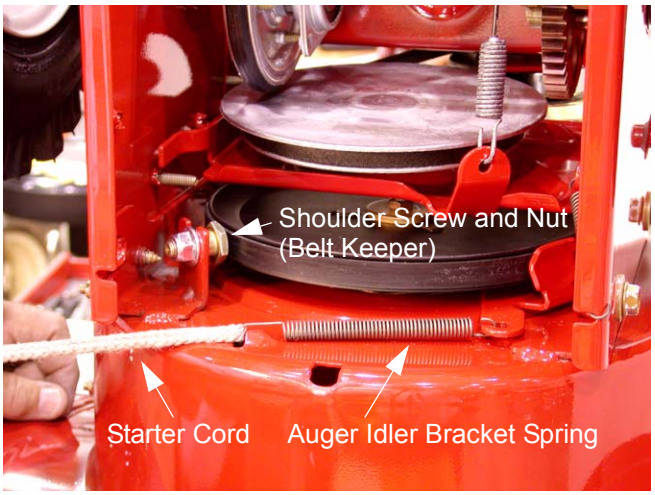

Figure 17

11.8. Using a 9/16” socket and a ¾” wrench, loosen and remove the shoulder screw which acts as a belt keeper.

11.9. Move the idler arm belt brake to the right as you remove the belt from around the auger pulley, and slip the belt between the support bracket and the auger pulley. See Figure 18.

Figure 18

11.10. Reassemble auger belt by following instructions in reverse order.

IMPORTANT: Do NOT forget to reinstall the shoulder screw and reconnect the spring to the frame after installing a replacement auger belt.

12. DRIVE BELT REPLACEMENT

To remove and replace your snow thrower's auger belt, proceed as follows:

12.1. Follow steps 11.1 trhough 11.6 in the AUGER BELT REPLACEMENT Section.

12.2. Use a length of starter cord to pull the idler pulley toward the right, away from the belt.

12.3. Wedge a piece of wood under the pulley to hold it in position. See Figure 19.

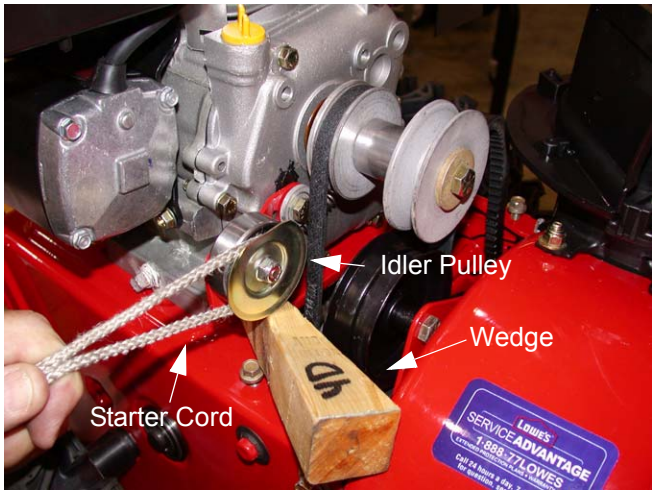

Figure 19

12.4. Roll the drive belt off engine pulley.

12.5. Roll the drive belt off the pulley and between friction wheel and friction wheel disc. See Figure 20.

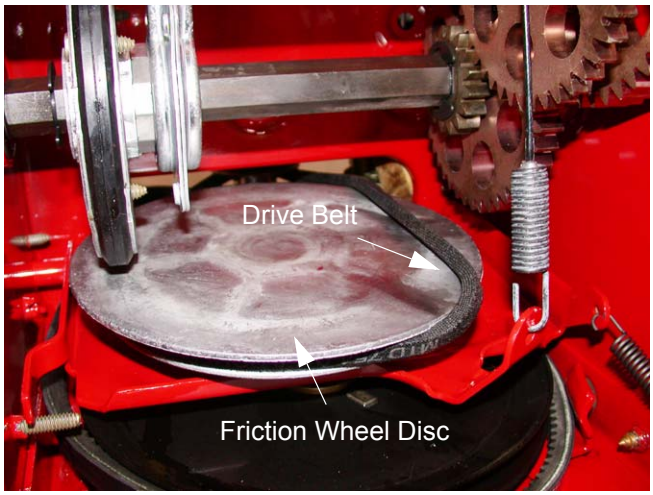

Figure 20

12.6. Replace belt in the reverse order.

13. FRICTION WHEEL REMOVAL

If the snow thrower fails to drive with the drive control engaged, and performing the drive control cable adjustment fails to correct the problem, the friction wheel may need to be replaced.

13.1. Examine the friction wheel for signs of wear or cracking and replace if necessary.

13.2. Place the shift lever in third Forward (F3) position.

13.3. Follow steps 11.1 through 11.5 in the AUGER BELT REPLACEMENT Section.

13.4. Using a ½" socket remove the screws and bell washers securing the wheels to the axles. Remove both wheels.

13.5. Using a suitable tool, carefully remove the outer E-ring which secures the hex shaft to the snow thrower frame and lightly tap the shaft's end to dislodge the ball bearing from the right side of the frame. See Figure 21.

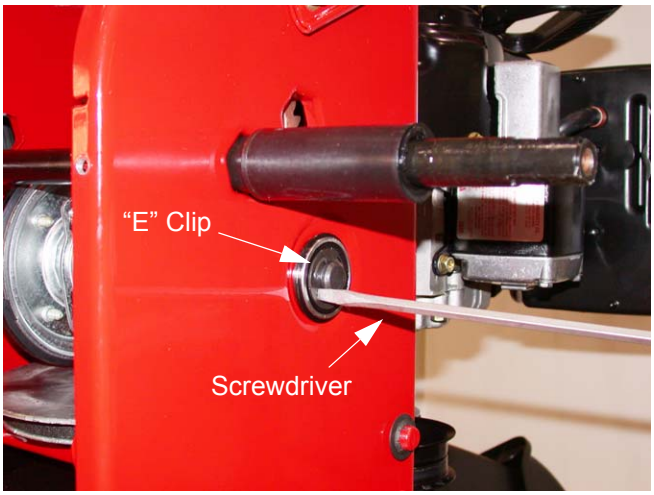

Figure 21

13.6. Slide the hex shaft to the left while carefully unmeshing the lower gears on the hex shaft from the upper gears on the wheel axle. See Figure 22.

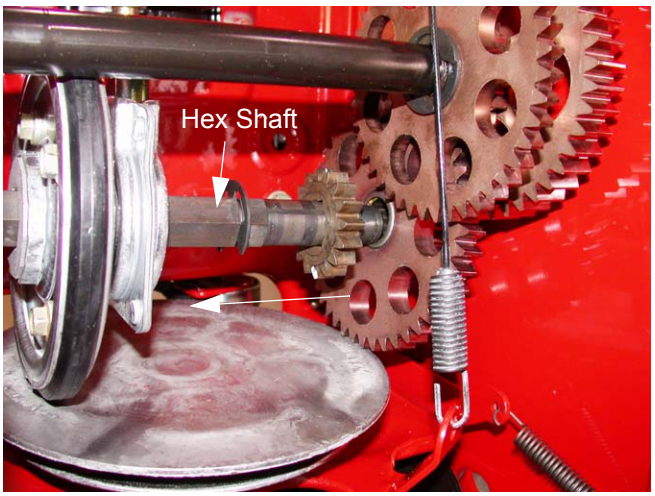

Figure 22

13.7. Set the hex shaft's gears aside.

13.8. Carefully remove the inner E-ring from the hex shaft and slide the friction wheel assembly off the hex shaft. See Figure 23.

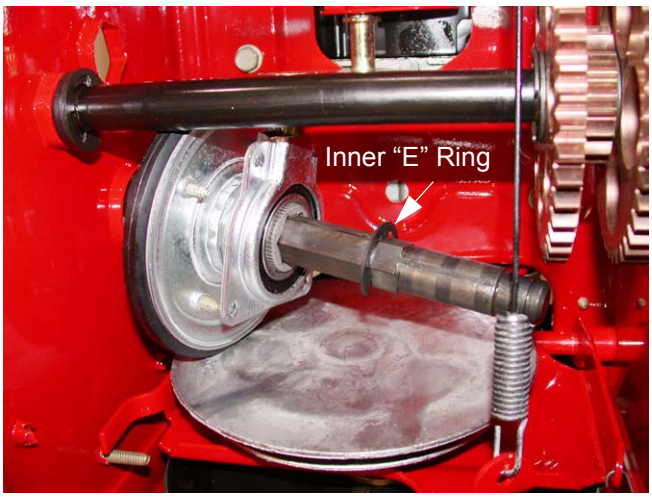

Figure 23

NOTE: Maintain the correct order of parts during disassembly.

13.9. Inspect the friction wheel and all components of the hex shaft for any wear or damage. See Figure 24.

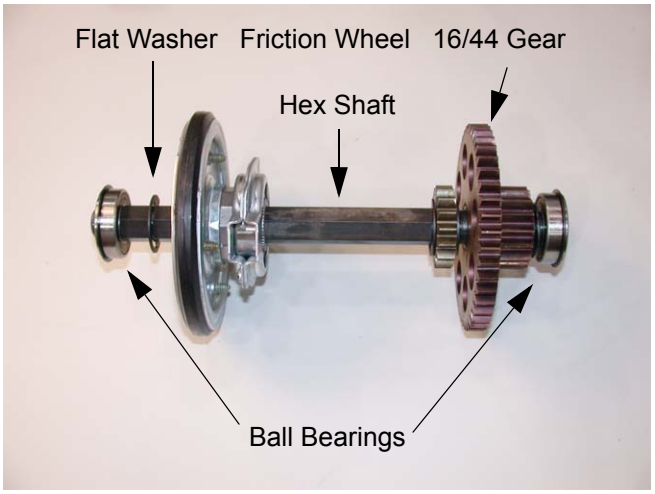

Figure 24

NOTE: The friction wheel can be replaced as an assembly or repaired.

If you're replacing the friction wheel assembly as a whole, discard the worn assembly and slide the new assembly onto the hex shaft. Follow the steps above in reverse order to reassemble components.

If you're disassembling the friction wheel and replacing only the rubber ring, proceed as follows:

13.10. Remove the four screws that secure the friction wheel's side plates together. See Figure 25.

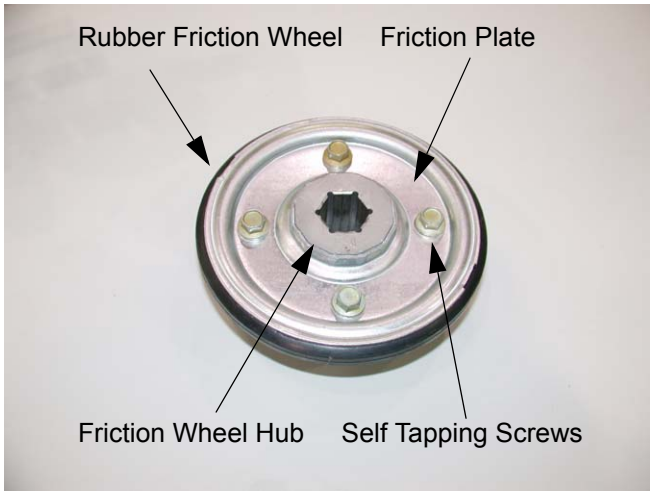

Figure 25

13.11. Remove the rubber ring from between the plates.

13.12. Reassemble the side plates with a replacement rubber ring.

IMPORTANT: Tighten each screw only one rotation before turning the wheel clockwise and proceeding with the next screw. Repeat this process several times to ensure the plates are secured with equal force.

13.13. Slide the friction wheel assembly back onto the hex shaft and follow the steps above in reverse order to reassemble components.

14. AXLE SHAFT REMOVAL

14.1. Follow steps 11.1 through 11.5 in the AUGER BELT REPLACEMENT Section.

14.2. Using a ½" socket remove the screws and bell washers securing the wheels to the axles. Remove both wheels.

14.3. Remove the extension spring from friction wheel support bracket. See Figure 26.

Figure 26

14.4. Use a 7/16" socket and back off the screw securing the cable roller to the guide bracket. Do not remove the screw. Slip the cable over the roller. See Figure 27.

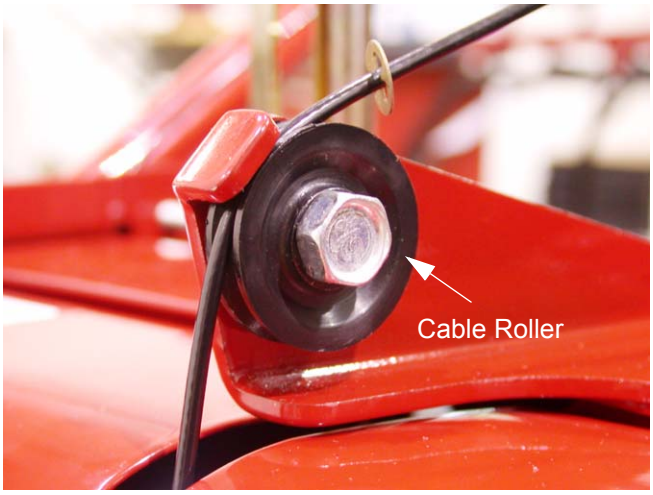

Figure 27

14.5. You can now easily remove the drive cable spring from the support bracket.

14.6. Remove both "E" cl ɔs from the axle shaft. See Figure 28.

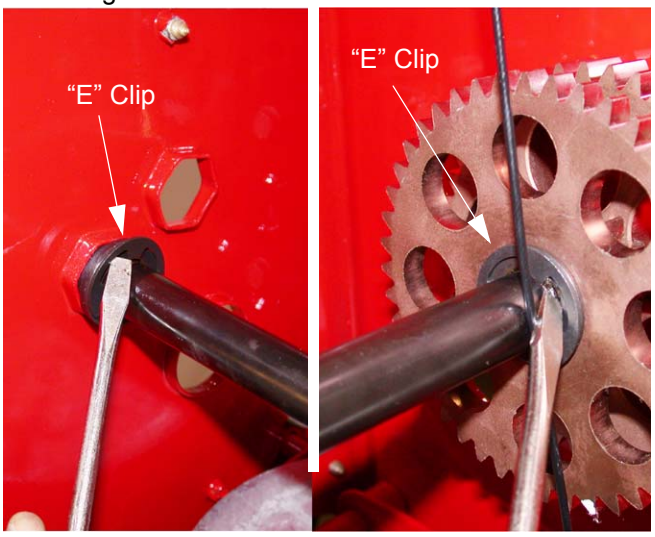

Figure 28

14.7. Slide the axle shaft to left to allow 44T gear to slide off the key. See Figure 29.

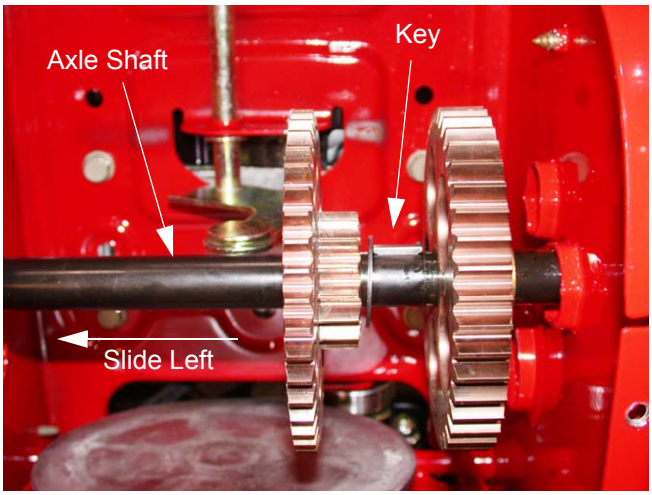

Figure 29

14.8. Remove key from the shaft.

14.9. Continue to slide axle shaft to the left as you remove the components from the axle shaft.

NOTE: Maintain correct order of parts.

14.10. Reassemble the components in reverse order.

15. SPLITTING THE UNIT

Splitting the unit in two allows easy access to the friction disk and auger pulley.

This is the preferred method of servicing these parts.

15.1. Drain the gasoline from the snow thrower, or place a piece of plastic under the gas cap.

15.2. Disconnect the spark plug wire from the spark plug.

15.3. Remove the hairpin clip securing the chute crank assembly to the chute crank bracket. See Figure 30.

Figure 30

15.4. Remove the washer and slide the crank assembly from the bracket.

15.5. Using a 3/8” socket and extension, remove the two self-tapping screws securing the plastic belt cover to the frame.

15.6. Remove the auger belt from around the engine pulley.

15.7. Using a 3/8” socket, remove the hex screw attaching the front auger cable guide bracket to the left side of the frame. See Figure 31.

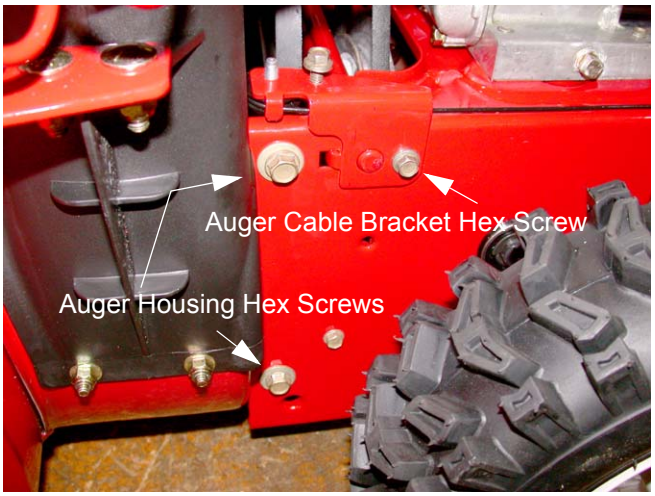

Figure 31

15.8. Unhook the extension spring from the auger drive idler bracket.

15.9. Using a ½" socket remove the four hex screws and bell washers securing the auger housing assembly to the frame.

15.10. Tip the handles back to allow separation of the auger housing from the frame. See Figure 32.

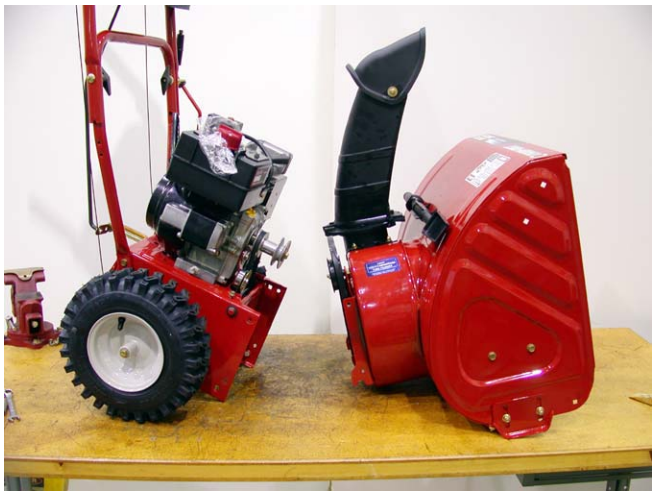

Figure 32

16. FRICTION WHEEL DISC DISASSEMBLY

16.1. Split the unit in two. See SPLITTING THE UNIT Section.

16.2. Tip the handles down towards the ground and rest them on 4x4s in order to not bend the shift lever.

16.3. Use a piece of starter cord to take tension off the friction wheel drive belt. See Figure 33.

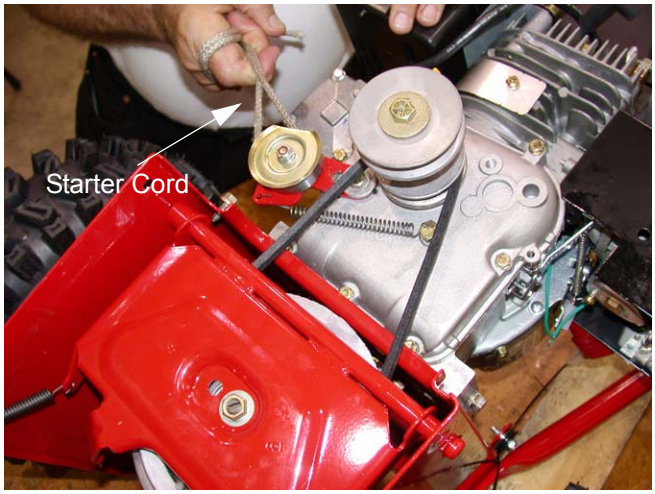

Figure 33

16.4. Remove the drive belt from around the engine pulley.

16.5. Using a screwdriver and 9/16" wrench, remove the jam nut and bell washer securing the friction wheel to the support bracket. See Figure 34.

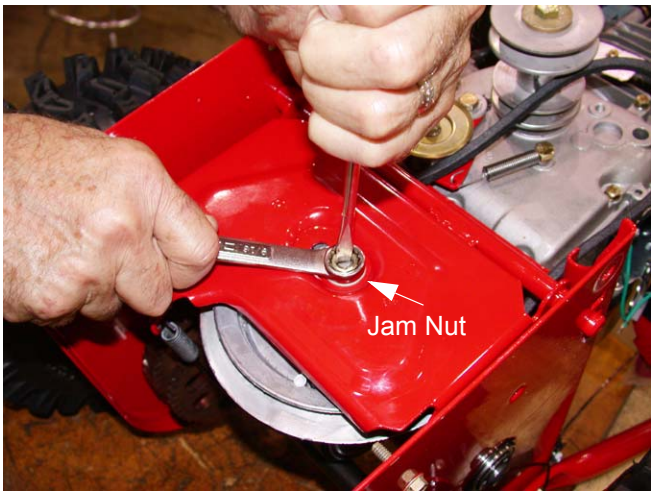

Figure 34

16.6. Remove the friction wheel from the bracket. See Figure 35.

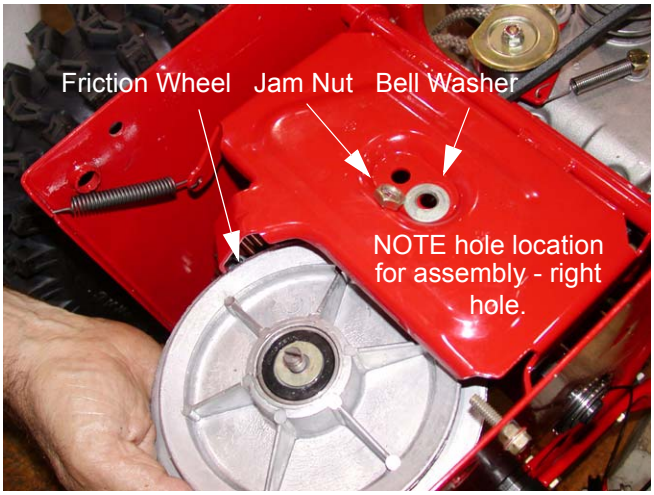

Figure 35

NOTE: Be aware of hole location during asembly. Use the hole on the right side as you face the unit when installing the friciton wheel. Use Locktite on the nut during assembly.

17. AUGER PULLEY REMOVAL

17.1. Split the unit in two. See SPLITTING THE UNIT Section.

17.2. Wedge a 2x4 between the spiral assembly and the auger hosing to hold it in place.

17.3. Using a 1/’2” socket, remove the screw and flat washer securing the auger pulley to the impeller assembly. See Figure 36.

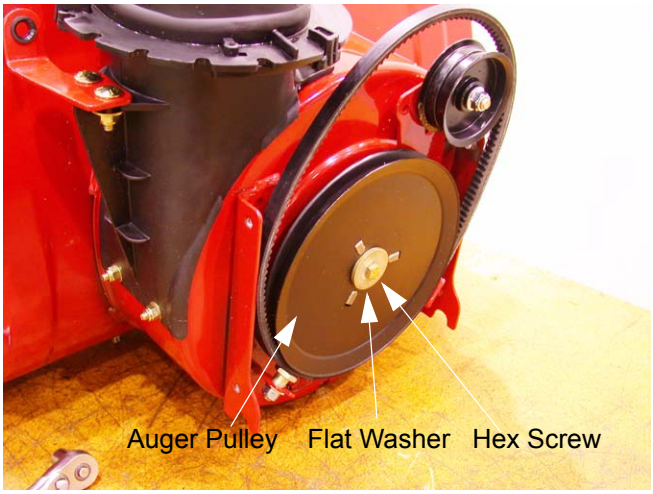

Figure 36

17.4. Inspect the pulley and adapter for any wear or damage.

NOTE: During reassembly use Loctite 242 on the screw.

NOTE: Torque to 160-200 inch pounds.

18. AUGER AND IMPELLER REMOVAL

18.1. Split the unit in two. See SPLITTING THE UNIT Section.

18.2. Remove the Auger Pulley. See AUGER PULLEY REMOVAL Section.

18.3. Using a ½” socket, remove the two flange lock nuts securing the bearing housing to the auger housing. Remove the bearing housing and bearing and inspect for wear or damage. See Figure 37.

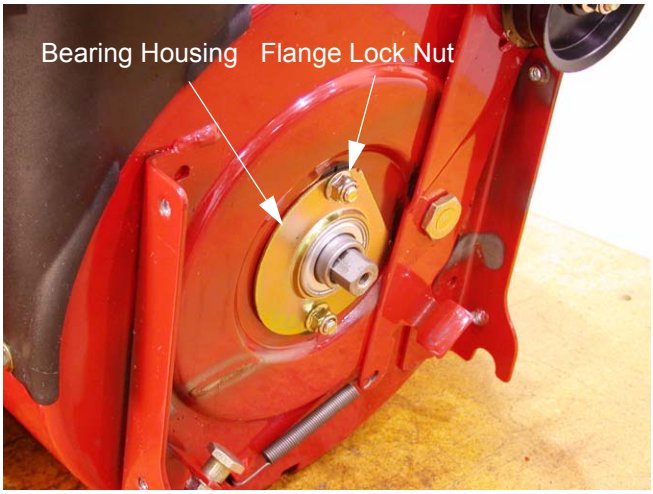

Figure 37

NOTE: The two carriage bolts used to secure the bearing housing are held in place by push-on nuts.

18.4. Lay the auger housing on its face.

18.5. Using a 1/2 “ socket, remove the four (two on each side) hex screws securing the auger assembly to the auger housing. See Figure 38.

Figure 38

18.6. Carefully tip back and remove the housing from the auger assembly. See Figure 39.

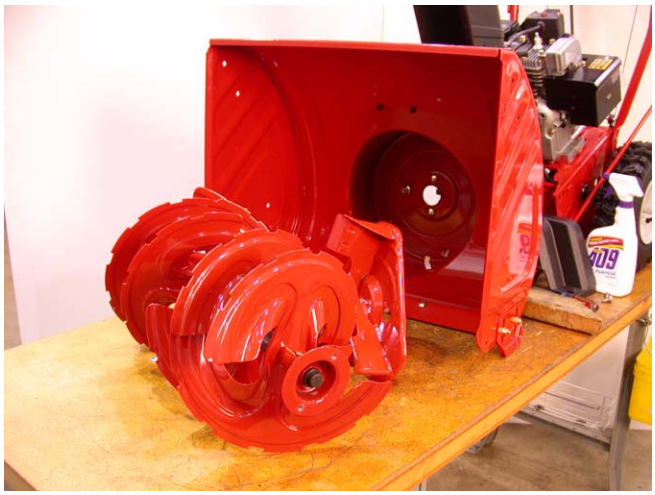

Figure 39

AUGER AND IMPELLER NOTES

- The impeller worm shaft is machined to match a double D machining in the impeller. See Figure 40.

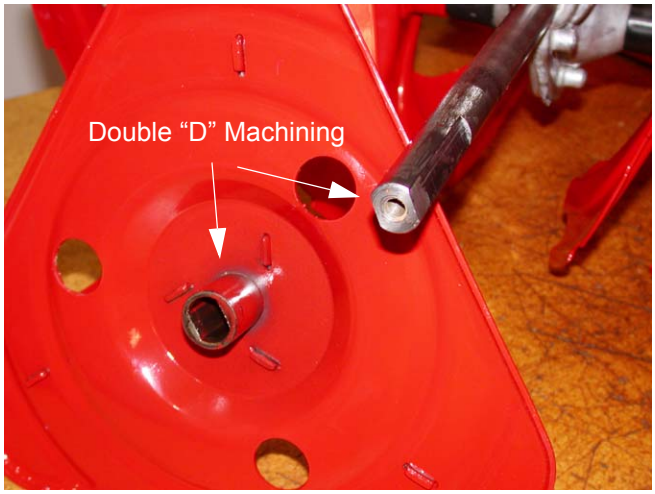

Figure 40

- Hex flange bearings are used at the ends of the auger axle. See Figure 41.

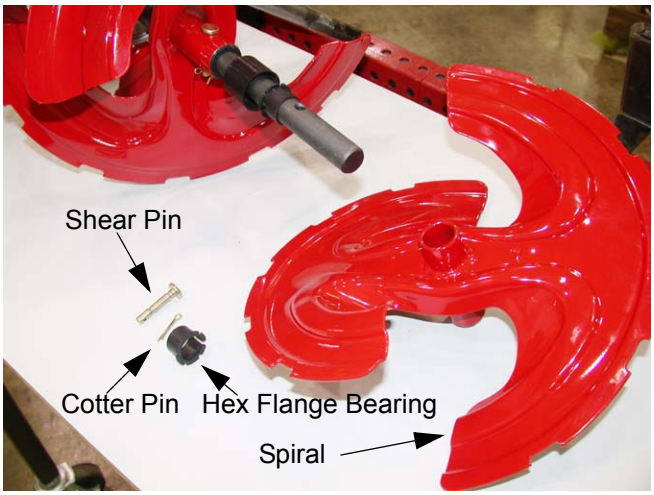

Figure 41

- There a four shear pins used to attach the spiral assemblies to the auger axle. Spare pins are shipped with the unit. See Figure 42.

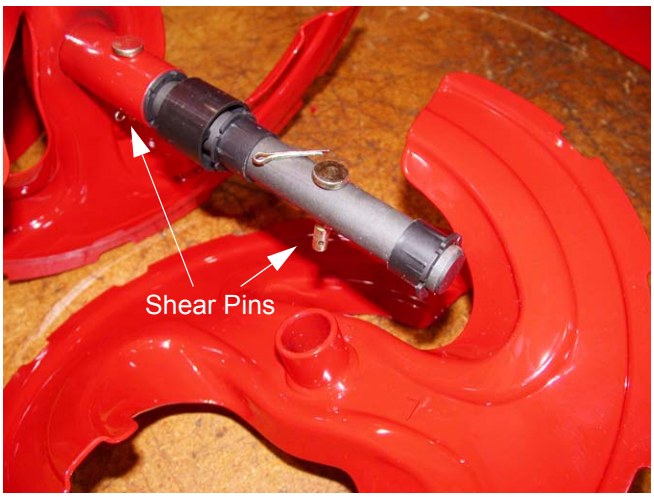

Figure 42

- Spiral assemblies are marked left and right for proper installation.

  NOTE: During assembly, place the auger housing face up when installing the auger and impeller assembly.

19. REDUCER TRANSMISSION

19.1. The reducer can be serviced. It can also be purchased as an assembly.

NOTE: On the top of the gearbox is inspection and access hole for adding grease when and if required. Remove the rubber grommet from the lubrication port. See Figure 43.

Figure 43

20. REDUCTION TRANSMISSION DISASSEMBLY

20.1. Using a 3/8” socket, remove the 5 self-tapping screws securing the reducer halves together. See Figure 44.

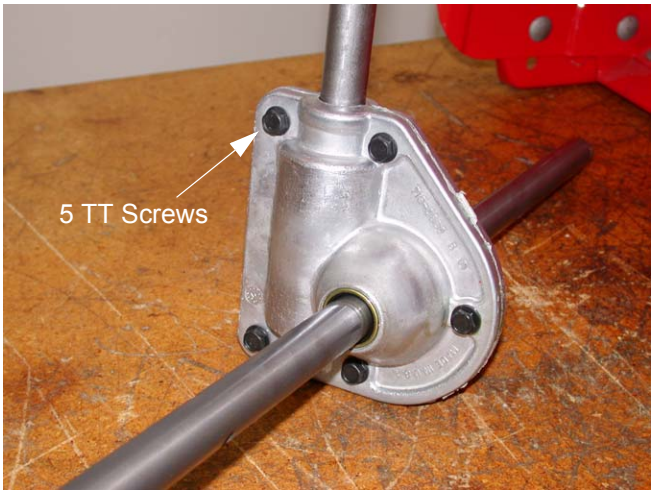

Figure 44

20.2. Separate the housing halves using a putty knife. See Figure 45.

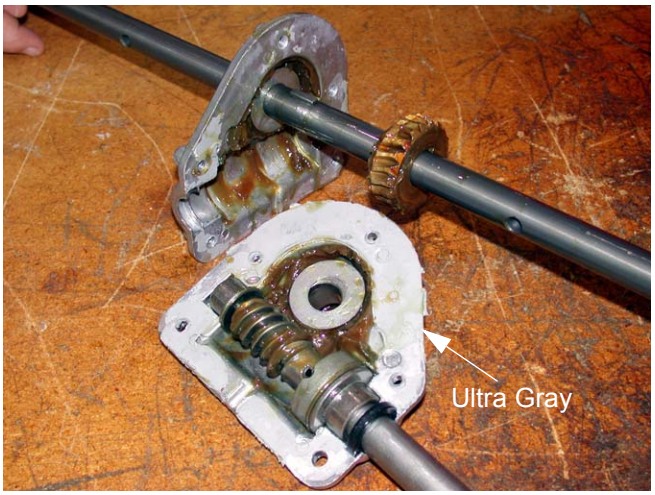

Figure 45

20.3. Inspect all internal parts for wear or damage.

NOTE: before assembly, clean off all of the ultra-gray sealant on both sides of the gearbox housing. Use ultra gray to reseal the housing before assembly.

21. AUGER IDLER ARM

21.1. Split the unit. See SPLITTING THE UNIT Section.

21.2. Remove the auger pulley. See AUGER PULLEY REMOVAL Section.

21.3. Align one of the holes in the impeller with the idler arm nut on the front of the auger housing. See Figure 46.

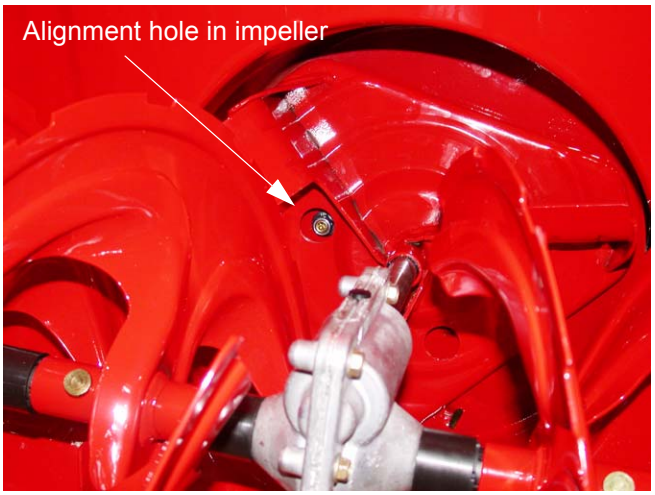

Figure 46

21.4. Using a 9/16’ socket on a long extension and a 15/16” socket on a ½’ socket wrench, remove the nut and shoulder screw attaching the idler bracket to the auger housing.

21.5. Inspect the idler pulley for wear or damage.

NOTE: The idler pulley can be removed using a 9/16” socket and a 9/16” opened end wrench.

22. CHUTE DISASSEMBLY

22.1. Using a screwdriver, pry open the three flange keepers securing the lower chute to the chute adapter. See Figure 47.

Figure 47

22.2. Lift off the lower chute.

22.3. Remove the hairpin clip securing the chute crank assembly to the chute crank bracket.

22.4. Remove the washer and slide the crank assembly from the bracket.

22.5. Using a 7/16” socket, remove the four flange lock nuts and washers securing the chute adapter to the auger housing. See Figure 48.

Figure 48

NOTE: Use caution when removing the nuts. The carriage screws are not attached to the auger housing.

22.6. Lift off the chute adapter.